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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/678,414	10/02/2000	David W. Carlson	NSC1-H1700 [P04797]	4381

7590 12/19/2001

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EXAMINER

KEBEDE, BROOK

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 12/19/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/678,414

Applicant(s)

CARLSON, DAVID W.

Examiner

Brook Kebede

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, “the layer of first material having top surface,” as recited in claim 1, line 6, and “layer of third material on the planarized layer of material; and the steps of etching the layer of third material” as recited in claims 10 and 11, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 4, 5, 12 and 13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 4 recites the limitation “wherein the structure has a thickness that ranges from a minimum thickness to a maximum thickness over the wafer upper level” in lines 1-3. There is no quantitative measurement that indicates the structure has a thickness ranges from a minimum thickness to a maximum thickness in the specification. Therefore, the limitation was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 5 recites the limitation “wherein the layer of first material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness” in lines 1-3. There is no quantitative measurement that indicates the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness in the specification. Therefore, the limitation was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 12 recites the limitation “wherein the structure has a thickness that ranges from a minimum thickness to a maximum thickness over the wafer upper level” in lines 1-3. There is no quantitative measurement that indicates the structure has a thickness ranges from a minimum thickness to a maximum thickness in the specification. Therefore, the limitation was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 13 recites the limitation “wherein the layer of first material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness” in lines 1-3. There is no quantitative measurement that indicates the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness in the specification. Therefore, the limitation was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Although an attempt has been made to identify all instances of claim language non-compliance, such identification is extremely burdensome due to the large number of instances. Examples are provided herein below. Since such noncompliance confuses the claims to the extent that not all of the problems are readily apparent, then upon amendment, if an alternative interpretation of claim language requires a change in the rejection, the new rejection may properly be made final.

Claim 1 recites the limitation "the wafer having top surface; wafer lower level; wafer upper level; first material having a top surface; first material having first lower level; and first material having upper level" throughout the claim. Figure 3A and the detail description of Figure 3A in the specification describe wafer as 300, i.e. the entire structure of Fig. 3A. However, the above recited limitations can not be comprehended by the Examiner and can not be understood what is really being claimed because it lacks clarity. Therefore the entire claim is vague and indefinite in its meaning and scope.

Claim 1 recites the limitation "forming a layer of second material on the top surface of the layer of second material" in lines 9-10. However, it is not clear to the Examiner how the second material is formed over the second material. Since the limitation lacks clarity in its meaning and scope, it is vague and indefinite.

Claims 2-17 are rejected as being dependent of the rejected independent base claim.

6. Applicants' cooperation is requested in reviewing the claims structure to ensure proper claim construction and to correct any subsequently discovered instances of claim language noncompliance. See *Morton International Inc.*, 28USPQ2d 1190, 1195 (CAFC, 1993).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-8 and 10-16 rejected under 35 U.S.C. 102(b) as being anticipate by Doan et al. (US/5,618,381).

Re claim 1, Doan et al. disclose a method for forming a planarized layer of material on a processed wafer, the wafer having a top surface, the top surface having a wafer lower level and a wafer upper level that lies above the wafer lower level, the method comprising the steps of: forming a layer of first material (22) on the top surface of the wafer, the layer of first material (22) having a top surface, the top surface of the layer of first material having a first lower level and a first upper level that lies above the first lower level; forming a layer of second material (60) on the top surface of the layer of first material (22); and chemically-mechanically polishing the layer of second material (60) and the underlying layer of first material (22) until the layer of second material (60) is all removed from the layer of first material (22) to form the planarized layer of material (see Figs. 1-3, 6 and 7 and Col. 2, lines 7-67 through Col. 5, lines 1-34).

Re claim 2, as applied to claim 1 above, Doan et al. disclose all the claimed limitations including the limitation wherein the first lower level lies above the wafer upper level (see Figs. 1-3, 6 and 7).

Re claim 3, as applied to claim 2 above, Doan et al. disclose all the claimed limitations including the step of etching the planarized layer of material to form a structure (see Figs. 1-3 and 6-7).

Re claim 4, as applied to claim 3 above, Doan et al. disclose all the claimed limitations including the limitation wherein the structure has a thickness that ranges from a minimum thickness to a maximum thickness over the wafer upper level (see Figs. 1-3 and 6-7).

Re claim 5, as applied to claim 4 above, Doan et al. disclose all the claimed limitations including the limitation wherein the layer of first material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness (see Figs. 1-3 and 6-7).

Re claim 6, as applied to claim 1 above, Doan et al. disclose all the claimed limitations including the limitation the first material as being polysilicon (see Col. 2, lines 26-29).

Re claim 7, as applied to claim 1 above, Doan et al. disclose all the claimed limitations including the limitation the second material is being an oxide (see Col. 4, lines 11-14)..

Re claim 8, as applied to claim 1 above, Doan et al. disclose all the claimed limitations including the limitation wherein the structure is a local interconnect line (see Figs. 1-3, 6 and 7).

Re claim 10 as applied to claim 2 above, Doan et al. disclose all the claimed limitations including the limitation step of forming a layer of third material on the planarized layer of material (see Col. 5, lines 1-26).

Re claim 11, as applied to claim 10 above, Doan et al. disclose all the claimed limitations including the limitation the step of etching the layer of third material and the planarized layer of material to form a structure (see Col. 5, lines 1-26).

Re claim 12, as applied to claim 11 above, Doan et al. disclose all the claimed limitations including the limitation wherein the structure has a thickness that ranges from a minimum thickness to a maximum thickness over the wafer upper level (see Figs. 1-3, 6 and 7).

Re claim 13, as applied to claim 12 above, Doan et al. disclose all the claimed limitations including the limitation wherein the layer of first material is formed such that the first lower level lies above the wafer upper level by a value that is equal to or greater than the minimum thickness (see Figs. 1-3, 6 and 7).

Re claim 14, as applied to claim 1 above, Doan et al. disclose all the claimed limitations including the limitation the step of doping the layer of first material prior to forming the layer of second material (see Col. 2, lines 26-29).

Re claim 15, as applied to claim 1 above, Doan et al. disclose all the claimed limitations including the limitation wherein the layer of first material is doped polysilicon (see Col. 2, lines 26-29).

Re claim 16, as applied to claim 3 above, Doan et al. disclose all the claimed limitations including the limitation wherein the layer of first material makes an electrical contact with a device on the wafer (see Figs. 1-3, 6 and 7).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doan et al. (US/5,618,381).

Re claim 9, as applied to claim 1 above, Doan et al. disclose all the claimed limitations. Regarding the first and second layers of material are chemically mechanically polished with a slurry that has a selectivity that falls within an approximate range of 0.9-1.1:1, the Examiner takes an Official notice since CMP process involves the introduction of a chemical slurry to facilitate higher removal rates and selectivity between films of the semiconductor surface such selectivity depends the composition of the slurry and the material that being removed and it is well-known in the art to determine the selectivity range of 0.9-1.1:1 given Doan et al. disclosure. See *In re Malcolm*, 129 F.2d 529, 54 USPQ 235 (CCPA 1942). See *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970).

Re claim 17, as applied to claim 1 above, Doan et al. disclose all the claimed limitations. Although the relative thickness range of the first and second material within the scope of Doan et al. disclosure, Doan et al. do not specifically disclose the second material is approximately two to three times as thick as the layer of first material. However, this thickness range can be achieved by one of ordinary skill in the art at desired thickness range by routine experimentation. Generally, differences in concentration or temperature or thickness of the film will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature or particular thickness range is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the

optimum or workable ranges by routine experimentation.” See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955); *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); *In re Kulling*, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Furthermore, the specification contains no disclosure of either the critical nature of the claimed thickness range or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d, 1936 (Fed. Cir. 1990).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure Meikle (US/5,795,495), Spikes et al. (US/5,981,354), Li et al. (US/6,162,368) and Blalock et al. also disclose similar inventive subject matter.

Correspondence

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brook Kebede whose telephone number is (703) 306-4511. The examiner can normally be reached on 8-5 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Brook Kebede

BK
December 14, 2001



Trung Dang
Primary Examiner